

Chapter XXI Batteries

A. GENERAL.

Environmental or safety incidents involving batteries, such as leaks, ruptures, or bulging should be handled through the DRMO/Host Installation Spill Contingency Plan. Batteries are one of the largest volume waste streams generated by military installations. Recent advances in closed loop supplier relationships and recycling allow DRMS/DRMSI to reduce batteries destined for ultimate disposal. Batteries are regulated under several criteria and DRMOs need to be aware of laws/regulations governing batteries in their areas.

A summary sheet for batteries is at Enclosure 1.

B. DEFINITIONS.

See Enclosure 2.

C. MANAGEMENT OF BATTERIES UNDER RCRA.

NOTE: Overseas – DRMOs should manage batteries according to OEBGD, Chapters 5 and 6 and the FGS.

1. Used batteries are considered spent materials and those exhibiting one or more of the hazardous characteristics in 40 CFR 261 Subpart B must be managed as hazardous waste or as universal waste.

2. **DRMOs have the option of managing batteries (that meet the criteria of a hazardous waste) under the universal waste management standards (40 CFR 273) or under the RCRA HW requirements.** The option whether to manage batteries as universal waste should be based on customer/host installation preference. Guidance for managing batteries as universal waste can be found in DRMS-I 6050.1, Chapter XXXII.

3. Some HW batteries can be managed as a RCRA recyclable material (40 CFR 261.6). Management of batteries as recyclable materials usually involves less stringent RCRA requirements. The specific requirements vary depending on battery type and recycling method. The following battery recycling methods are exempt from the full RCRA requirements:

a. Spent lead acid batteries that are being reclaimed; (i.e., sold to a recycler or ultimate disposal to a recycler). (See Subpart G, 40 CFR 266.)

b. Batteries from which precious metals are reclaimed; (e.g., batteries for silver recovery under the Precious Metals Program). (See 40 CFR 266 Subpart F.)

c. Used batteries sold as substitutes for new battery commercial products (40 CFR 261.2(e)(ii)).

4. DRMOs must manage batteries in compliance with the speculative accumulation requirements in RCRA (40 CFR 261.1(b)(2)(c)(8) and 261.2). The speculative accumulation provisions apply when DRMOs receive batteries that would be a hazardous waste when disposed (used battery/spent material), but process them in a manner where they would not be a hazardous waste (i.e., selling used batteries for use as a battery or for the parts). If batteries are being managed by this method, DRMOs must maintain proof that the batteries are actually being processed for a legitimate purpose. DRMOs must be able to show a turn over of 75% of its beginning calendar year inventory in order to continue to manage these batteries as a material. If this amount is not met, then RCRA considers them to be speculatively accumulated and are then considered wastes.

5. Battery parts and/or electrolyte separated from a battery that meets the criteria of a HW

based on 40 CFR 261 Subpart B must be managed as hazardous waste.

6. HW batteries must be stored in accordance with 40 CFR 262.34, 40 CFR 264/265 and 29 CFR 1910.120 or the universal waste standards for large or small quantity handlers (40 CFR 273).

D. MERCURY-CONTAINING AND RECHARGEABLE BATTERY ACT.

1. This Act (signed May 13th 1996) was designed to phase out the use of mercury in batteries and provide for the efficient recycling/disposal of certain rechargeable batteries (i.e., small dry nickel-cadmium batteries, small dry lead-acid batteries, and other rechargeable batteries). The Act facilitates a largely private-sector collection program and public awareness campaign to encourage recycling of these batteries. The Rechargeable Battery Recycling Corp (RBRC) administers this recycling program. Overseas DRMOs should consult DRMSI-H on host nation regulations.

2. This Act effects DRMO battery management in the following ways:

a. Small dry rechargeable batteries may be managed as universal waste without state adoption of the universal waste rule. DRMOs do not have to determine state universal waste status to manage these batteries as universal waste. See Chapter XXXII for additional guidance on implementing the universal waste management standards.

b. Certain batteries containing mercury may no longer be offered for sale:

(1) Alkaline or carbon-zinc battery that contains mercury that was intentionally introduced (versus mercury that may have been incidentally present in other materials). Most of these batteries are no longer manufactured with mercury intentionally added. However, DRMOs may encounter older batteries that could meet this criterion. When these batteries are offered for sale, DRMOs need to determine either through review of the MSDS, contact with the manufacturer, or

generator information, whether these batteries contain intentionally added mercury. DRMOs can use the lot number normally printed on the battery as a reference for the manufacturer.

(2) Button cell mercuric-oxide batteries are prohibited for sale.

(3) All other types of mercuric-oxide batteries are prohibited from sale unless the DRMO informs the purchaser of where a collection site is located for the recycling/disposal of these batteries.

c. There is a labeling requirement for nickel-cadmium batteries, small lead acid batteries, and rechargeable consumer products. Batteries and/or rechargeable battery containing products that were manufactured on or after May 13, 1997, cannot be sold unless they contain these labels (see Label Requirements in paragraph D4). Batteries or products manufactured before this date are not subject to the labeling requirement and can continue to be offered for sale without these labels.

d. The RBRC has a national recycling program for small sealed dry NiCad batteries that provides disposal/recycling at no cost to the battery generator (generator pays transportation cost only). Batteries disposed through DRMS disposal contracts are not eligible for participation in this program due to requirements associated with our disposal contracts. Generators who may wish to take advantage of this disposal opportunity should not turn these batteries into the DRMO. DRMOs should inform these generators that they should ship these batteries themselves, directly to the designated recycling facility (INMETCO, Ellwood City, PA). DRMOs should work with generators who have significant quantities of these NiCad batteries and want to use this disposal option to determine if any DRMS disposal contract adjustments are necessary.

3. **Prohibitions on Sale.** DRMOs may not sell for use in the United States, a regulated battery or rechargeable consumer product that was manufactured on or after May 13, 1997, unless

the labeling requirements described below are met and the regulated battery is easily removable from the rechargeable consumer product or sold separately. This prohibition does not apply to:

- a. Remanufactured products unless the above applied at the time of original manufacture.
- b. The sale of a product unit is intended for export purposes only.

4. Labeling.

a. For any small dry NiCad or lead acid battery or rechargeable consumer product with such battery, that is manufactured or imported on or after May 13, 1997, the following labels are required:

(1) 3 chasing arrows or a comparable recycling symbol.

(2) For nickel-cadmium batteries: a label that contains the chemical name or the abbreviation "Ni-Cd" and the phrase **"BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY"**.

(3) For lead acid batteries, a label that contains the abbreviation **"Pb"**, or the words **"LEAD"**, **"RETURN"**, and **"RECYCLE"** and if the regulated battery is sealed, the phrase **"BATTERY MUST BE RECYCLED"**.

b. One of the following phrases must be on each rechargeable consumer product containing a regulated battery that is not easily removable:

"CONTAINS NICKEL-CADMIUM BATTERY. BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY."

or

"CONTAINS SEALED LEAD BATTERY. BATTERY MUST BE RECYCLED."

c. One of the following phrases must be on the packaging of each rechargeable consumer product, and the packaging of each regulated battery sold separately:

"CONTAINS NICKEL-CADMIUM BATTERY. BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY."

or

"CONTAINS SEALED LEAD ACID BATTERY. BATTERY MUST BE RECYCLED."

5. Limitations On The Sale Of Batteries Containing Mercury. DRMOs shall not sell:

a. Alkaline-manganese battery with a mercury content that was intentionally introduced (versus mercury that may be incidentally present in other materials), except alkaline-manganese button cells may contain 25 milligrams of mercury per button cell.

b. Zinc-carbon battery that contains mercury that was intentionally introduced (versus mercury that may be incidentally present in other materials).

c. Button cell mercuric-oxide battery.

d. DRMOs shall not sell, or offer for sale, any mercuric-oxide battery (non-button cell type) for use unless the DRMO provides a purchaser with the following below. Assistance in determining suitable facilities for mercury battery recycling can be obtained by contacting DRMS-LHO, (DSN)932-5931 or DRMSI-H (DSN)338-7326.

(1) A facility that meets Federal, State, and local government approvals, to which mercuric-oxide batteries may be recycled or properly disposed.

(2) Informs each purchaser of mercuric-oxide batteries of a telephone number that the purchaser may call to get information about

sending mercuric-oxide batteries for recycling or proper disposal.

E. MANAGEMENT AND PROCESSING OF BATTERIES.

1. Batteries will be turned-in to a DRMO as either hazardous material (HM) or hazardous waste (HW). Whether they are managed as HM or HW will depend upon such factors as:

- a. The type of battery and its characteristics;
- b. The condition of the battery (used/unused);
- c. The intended disposition of the battery; (RTDS, recycling, or disposal),
- d. Whether they are a RCRA hazardous waste or as universal waste when disposed.

2. Batteries going for RTDS can be managed as HM.

3. Hazardous waste batteries managed as universal waste can also be received and managed as HM.

4. Batteries going for ultimate disposal will be managed as either a HW or non-hazardous solid waste depending on the RCRA characteristics of the battery.

5. DRMOs will follow the specific management requirements for various battery types in Section H of this chapter.

F. TURN-IN REQUIREMENTS.

1. DRMOs will follow the turn-in requirements in DoD 4160.21-M, Chapter 10 for batteries.

2. Batteries must be non-leaking and safe to handle, or if leaking and unsafe to handle – they must be over-packed in containers.

3. Department of Transportation (DoT) specified containers are not required for batteries turned in to the DRMO. However, the transport-

ing activity is required to comply with all DoT regulations if transporting from off-site and over the highway for turn-in to the DRMO.

4. Batteries turned-in as HW must have either a Hazardous Waste Profile Sheet (HWPS) or Material Safety Data Sheet (MSDS). Batteries turned-in as HM should have a MSDS if available from the manufacturer or through HMIS. Batteries turned-in as universal waste can have a HWPS, MSDS, or any other information to identify material hazardous.

5. DRMOs will take custody of HW batteries when they possess conforming storage. Batteries that are HM will be accepted at DRMOs that have conforming storage facilities, appropriate general warehousing, or suitable outside storage where batteries can be properly stored (see DRMS-I 6050.1, Chapter III for more storage information).

6. Generators are not required to drain wet celled batteries prior to turn-in. The criteria for whether a DRMO can accept undrained wet batteries is based on the ability of DRMOs to provide protection from freezing and to prevent contamination of surface water.

7. DRMOs that do not have storage capability will accept accountability only.

8. Batteries of different types must not be co-mingled together.

G. STORAGE AND HANDLING REQUIREMENTS.

1. General Storage Requirements.

a. Batteries require cool, well ventilated, dry storage. Batteries should be protected from extreme heat or freezing. Temperatures for any battery should not exceed 130 degrees F.

b. Batteries that are HW must also be stored in accordance with 40 CFR 262.34, and/or 40 CFR 264/265.

c. Batteries that are HM and/or universal waste can be stored in general purpose warehouses that meet the criteria for storage of haz-

ardous materials (see DRMS-I 6050.1, Chapter III and Chapter XXXII for additional guidance).

d. Outdoor battery storage should incorporate measures to prevent or minimize ground contamination and storm water runoff contamination. Outside storage for batteries should provide shelter through roofs, berms, and/or walls. DRMOs should coordinate storage with their host installation to determine state/local or storm water requirements. When outside storage is used, the following conditions apply:

(1) Undrained/wet cell batteries should not be allowed to freeze during the time they are stored at the DRMO. Batteries can be damaged in freezing temperatures. The temperature at which the batteries will freeze depends on the electrical charge on the battery. The lower the charge the higher the temperature for freezing.

(2) Batteries should be stored on a pallet on concrete, asphalt, or other hardpan surface which will prevent ground contamination.

(3) Precautions are taken through the use of roofs, berms, tarps or plastic to keep batteries dry and to prevent contamination of storm/ surface water runoff.

(4) Adequate outside storage space is available to ensure safe storage and protection from physical damage.

(5) The batteries are inspected weekly.

e. Batteries stored on pallets must be stacked as evenly as possible, banded or otherwise secured to prevent the batteries from falling over.

f. Drained batteries, including those with broken cases or that have been drilled, should be stored on their sides or upside down to keep rain water out.

g. It is recommended that if batteries are stacked more than one layer high that each layer is separated by either plywood, or heavy fiberboard. Plywood is preferable to separate layers of batteries, fiberboard will deteriorate severely during outside storage.

h. Batteries should be stored in an area away from scrap metal or any other objects that could potentially short circuit the cells creating a burn/fire hazard.

i. Observe chemical compatibility requirements when storing batteries. The chemical makeup of batteries can vary considerably. For additional guidance on storing batteries, spent electrolytes, or components, see DLA-I 4145.11, Storage and Handling of Hazardous Materials.

2. Processing of Batteries.

a. Unused batteries or batteries with reuse potential should not be disposed via disposal contract until the RTDS cycle is complete.

b. Batteries should be segregated by type and size to maximize RTDS.

3. Requirements for Transporting Batteries From the DRMO.

Shipments of batteries from a DRMO or generator location over public roadways must comply with DoT/host nation or international marking, labeling, packaging, and placarding requirements as applicable for the specific battery type.

4. Safety and Health Requirements.

a. Wet Cell and Undrained Batteries. The following equipment and facilities must be available, if any are not available, the DRMO should make every effort to obtain them. Refer to DRMS-H 6055.1, Safety and Occupational Health Instruction.

(1) Splash-proof goggles, face shields, acid proof gloves, aprons, boots, and battery carriers.

(2) Adequate water sources to neutralize/wash down inadvertent spills. Appropriate spill kits as specified in Spill Contingency Plan, and applicable regulations.

(3) Eyewash and shower facilities.

(4) Powered material handling equipment to load/unload batteries safely.

b. Dry Cell and Non-Leaking Batteries. Non-leaking, dry cell batteries require no special protective equipment for handling.

c. For additional battery handling PPE guidance, consult DRMS-H 6055.2.

H. SPECIFIC MANAGEMENT BY BATTERY TYPE.

1. Lead Acid Batteries

a. Regulatory Information.

(1) Lead acid batteries, drained or undrained when discarded via disposal are regulated as a HW (40 CFR 261.22 and 261.24) or as universal waste (40 CFR 273).

- Lead acid batteries normally possess the TC characteristic of lead (D008) and if a wet celled battery, the characteristic of corrosivity (D002).

- The land disposal restriction program includes a D008 subcategory specifically for lead acid batteries. This subcategory mandates the recovery of lead as the standard treatment method.

- The battery acid is regulated as a HW (D002). Used battery acid can also possess the characteristic of lead (D008). Battery casings are not a HW unless it is discarded and not recycled, then TC characteristic (D008) apply.

(2) Recycling of lead acid batteries (40 CFR 266.80).

NOTE: Overseas – Host nation and international laws may regulate lead acid batteries destined for recycling as hazardous waste.

- Lead acid batteries managed as a recyclable material (reclamation of the lead) are not regulated as a HW until the batteries arrive at the recycling facility. When managed as a recyclable material, there are no RCRA requirements associated with the generation, transportation, or storage of these batteries.

- Land Disposal Restriction notifications are not required for shipments of lead acid bat-

teries that are recycled. However, DRMOs must place a one time notification in their files describing such generation, subsequent exemption from full Subtitle C regulation, and disposition of the batteries (40 CFR 261.6(a)(2) and (40 CFR 268.7(a)(7)). Overseas DRMOs should consult the FGS.

(3) Transportation.

- DoT 49 CFR regulates wet lead acid batteries as HM in transport. Shipments of lead acid batteries (wet) for recycling shall comply with the requirements in 49 CFR Parts 172.101 (the Hazardous Materials Table (HMT)) and 173.159).

b. Special Turn-In Requirements.

(1) Lead acid batteries may be packaged in individually weather-resistant fiberboard boxes, wooden boxes, or unboxed but properly secured on pallets. Large size fiberboard boxes that can store numerous batteries are not acceptable.

(2) Generators are not required to drain lead acid batteries prior to turn-in. The criteria for whether a DRMO can accept undrained lead acid batteries is based on protection from freezing and rupturing and avoiding contamination of ground and storm water runoff.

(3) When a DRMO does not possess adequate storage capability for undrained batteries, DRMOs shall:

- Accept accountability only of the undrained batteries but not physical custody, or,

- Inform the generator that they have the option to drain the battery and turn the drained batteries and electrolyte separately into the DRMO.

(4) Battery terminals must be protected from external short circuits by proper stacking (so terminals are not touching), individual packaging, or use of electrical tape. Batteries placed on pallets must be secured regardless of height (by use of non-metallic or metallic strapping material or other methods which protects against short circuits and firmly secures the batteries to the pallet;

e.g., shrink-wrap). When metallic strapping is used, sturdy, cut-resistant, non-conductive material will be placed over the battery terminals (such as wood or fiberboard). Batteries stacked on pallets must not use the battery terminals to support the weight.

(5) The total weight of lead acid batteries on one pallet must not exceed 2,000 lbs. Stacking height must not exceed 1 1/2 times the width of the stack. Lead acid batteries should be stacked no more than three layers high.

c. Special Processing Requirements.

(1) Large volumes of lead acid batteries may be downgraded to scrap (SCL D5A) upon receipt **only** if the batteries *will be* recycled. Lead acid batteries are not scrap metal under RCRA, but a downgrade to scrap is allowed only as a DRMS management practice to ease DRMO workload from having to manage numerous turn-ins of lead acid batteries as accountable items. Downgrading lead acid batteries to scrap should not be construed that these batteries are actually scrap metal or that DRMS considers batteries as scrap metal for regulatory purposes. Batteries received as scrap that fail R/T/D/S and will be placed on a disposal contract should be upgraded to a HM/HW item and the DRMO should pursue obtaining disposal funding from the generator.

(2) Small rechargeable lead acid batteries going through sales must be properly labeled in accordance with the Mercury-Containing and Rechargeable Battery Management Act, where applicable (See paragraph D, above).

d. Special Storage and Handling Requirements.

(1) Sealed automotive lead acid batteries will be stored upright. Batteries with electrolyte should be handled in a manner to prevent cracking of the case/spilling of electrolyte. The most severe hazard associated with storing sealed automotive batteries is damage to the cases, allowing the electrolyte to spill. Protect from freezing.

(2) To avoid acid spills, sealed lead acid batteries must not be handled as bulk battery scrap. They must be stored separately from bulk drained battery scrap.

(3) DRMOs will not commingle batteries/bulk battery scrap with other scrap.

(4) Pallets containing lead acid batteries containing three layers will not be stacked more than one tier high. Pallets containing lead batteries of one or two layers may be stacked two tiers high provided the palletized unit is capable of supporting an additional tier without damage to batteries, pallets, or strapping/banding and batteries are secured to the pallet.

e. Special Requirements for Transporting Lead Acid Batteries From the DRMO (49 CFR 173.159).

(1) Undrained lead acid batteries must be packaged using a DoT specification packaging or firmly secured to a pallet.

(2) Lead acid batteries should be loaded or braced to prevent damage and short circuits in transit, according to DoT regulation.

(3) Lead acid battery terminals must be protected from short circuits by proper stacking/packaging (ensure terminals are not touching; i.e., use of electrical tape).

2. Nickel- Cadmium NiCad Batteries

a. Regulatory Information

(1) Used/unused NiCad batteries being discarded through disposal are regulated as a HW due to the presence of cadmium. The RCRA waste code is D006.

(2) The land disposal restriction program includes a D006 subcategory specifically for Ni-Cad batteries that mandates thermal recovery of the metals as the standard treatment method.

(3) Recycling used NiCad batteries. Used Nicad batteries are considered spent materials for the purpose of regulation. (40 CFR 261.2.)

- NiCad batteries that are reclaimed for their material content must be managed as HW (see definition at Enclosure 3).

- If used Nicad batteries are recycled in a manner where they are considered a substitute for a commercial product (i.e., sold for use as batteries, or returned to a battery manufacturer), they can be managed as HM depending on the speculative accumulation requirements (see paragraph C4). If a DRMO determines that used NiCad batteries are eligible for management as a material, the burden of proof is on the DRMO to show that the batteries are not being speculatively accumulated in order to be exempt from regulation as a HW. If a DRMO is unsure of the recycling method to use, they should be conservative and receive and manage them as HW.

b. *Special Turn-In Requirements.* NiCad batteries have the same special turn-in requirements as lead-acid batteries (see paragraph H1b).

c. *Special Storage and Handling Requirements.* NiCad batteries shall be stored and handled in the same manner as lead-acid batteries (see paragraph H1d).

d. *Special Processing Requirements.*

(1) NiCad batteries will not be downgraded or managed as scrap.

(2) Small rechargeable NiCad batteries going through sales must be properly labeled in accordance with the Mercury-Containing and Rechargeable Battery Management Act, where applicable (See Section D).

e. *Special Requirements for Transporting From the DRMO.* Packaging requirements for NiCad batteries are identical to those for lead-acid batteries (see paragraph H1e).

3. Lithium Sulfur Dioxide Batteries (LiSO₂).

a. *Regulatory Information.*

(1) Lithium batteries are divided into the following categories: balanced or unbalanced (see enclosure 4). Unbalanced lithium batteries are

regulated as ignitable (D001) and reactive (D003) hazardous waste. Balanced lithium batteries can be regulated as either a D001 and/or a D003 HW or as a non-hazardous solid waste when the battery contains a Complete Discharge Device (CDD) and it has been properly discharged. Lithium batteries that have a CDD and have been properly discharged do not possess the characteristic of ignitability or reactivity. Lithium batteries that do not contain a CDD or have a defective CDD cannot be completely discharged and are still considered reactive under RCRA. When sent to disposal, they are regulated as HW (40 CFR 261.23.). Most lithium batteries currently used by DOD are of the balanced type. Earlier types of lithium batteries used by DOD were of the unbalanced type.

b. *Special Turn-In Requirements.*

(1) DRMOs will take accountability and physical custody of balanced lithium batteries only under the following circumstances.

- The batteries are properly identified and include a certification on the DD Form 1348-1/1A by the generating activity that the batteries are “balanced cell batteries.”

- They are in the original container, if unused, or packaged in fiberboard boxes or plastic bags if used.

- The DRMO has adequate facilities to store batteries.

- Lithium-Sulfur Dioxide batteries with a CDD. These batteries contain a discharge switch, which if activated and stored for at least 5 days will render the battery non-hazardous (for reactivity) by RCRA definition. Verify that the CDD has been activated for at least 5 days. DRMOs will not activate the CDD switch. Refer generating activities who wish to turn these batteries in to their environmentalist for specific disposal guidance because these batteries may be disposed with general refuse. In the event that completely discharged batteries are turned-in, dispose as non-hazardous solid waste under service contract. Overseas must verify solid waste restrictions and requirements before disposal.

(2) DRMOs will take accountability but not physical custody of unbalanced batteries.

c. *Special Storage and Handling Requirements.*

(1) Lithium batteries should be segregated from other flammables and kept in a cool, dry facility which has sprinklers and is well ventilated. Lithium metal will react exothermically with water (from sprinklers); however, because each cell is hermetically sealed and pressurized, direct contact of the cell contents with water is prevented under normal situations.

(2) If fire should occur within a storage facility, there is the possibility that heat generated from combustion of other materials will cause the cells to vent or rupture. This is a greater hazard than the possible reaction of lithium and water. If a facility with sprinklers is not available, a second storage choice is a noncombustible warehouse. In either case, a Class D fire extinguisher or a dry, graphite-based compound for metal fires must be available for local use.

d. *Special Processing Requirements.*

(1) Do not downgrade to scrap.

(2) Process for disposal, upon receipt, discharged or expended shelf-life lithium batteries.

e. *Special Requirements for Transporting Lithium Batteries.*

(1) Lithium cells and batteries must be shipped in accordance with 49 CFR 172.101 HMT and 49 CFR 173.185.

(2) Lithium batteries may be shipped as a Class 9 item if they meet the requirements of 49 CFR 173.185(e).

(3) Lithium batteries going to disposal by motor vehicle may be offered for transportation in accordance with and 49 CFR 173.185(h).

- Cells when new, must not contain more than 12 grams of lithium and batteries may not contain more than 500 grams of lithium or lithium alloy.

- Each battery must be equipped with an effective means to prevent an external short circuit.

- Outside containers for lithium batteries must conform to the requirements of 49 CFR 173.24 and 173.24a.

4. **Magnesium Batteries.**

a. *Regulatory Information.* Unused or partially discharged (greater than 50 percent of the original charge remaining) magnesium batteries if discarded through disposal are regulated under RCRA as a HW due to the presence of chromium. The RCRA waste code is D007. Spent magnesium batteries or magnesium batteries with less than 50 percent remaining charge, if discarded through disposal are non-hazardous solid waste. These batteries have been shown not to fail TCLP for chromium.

b. *Special Turn-In Requirements.*

(1) Obtain information from the generator as to whether the magnesium batteries are unused, greater than or less than 50 percent partially discharged, or totally discharged. The amount of charge remaining will determine whether the batteries are disposed as a RCRA HW or non-RCRA solid waste.

(2) Magnesium batteries will be turned-in as HM. However, unused batteries or batteries with more than 50 percent of its original charge remaining that cannot be R/T/D/S for any reason (e.g., damaged) will be turned in as HW.

(3) Magnesium batteries where no information is available pertaining to its remaining charge will be handled as HW.

c. *Special Storage and Handling Requirements.*

(1) Hermetically sealed magnesium batteries are safe to handle.

(2) Store magnesium batteries in a cool, dry, well ventilated area.

(3) Do not store magnesium batteries in sealed air tight containers since they may give off hydrogen gas. The build up of hydrogen gas from the batteries may produce container over-pressure and lead to explosive conditions. Do not store in areas where the temperature will exceed 130 degrees Fahrenheit.

5. Mercury (Hg) Batteries.

a. *Regulatory Information.*

(1) Used/unused mercury batteries being discarded through disposal are regulated as a HW due to the presence of mercury. The RCRA waste code is D009.

(2) Recycling mercury batteries. Used mercury batteries are also considered under RCRA to be spent materials for the purpose of regulation. (40 CFR 261.2.)

- Mercury batteries that are reclaimed for material content will be managed as HW.

- If mercury batteries are sold for use/reuse in any other manner (i.e., sold for use as a battery or for parts), they should be managed as HM or HW based on the speculative accumulation rule (see paragraph C.4, above). DRMOs must know how mercury batteries will be recycled before they determine whether they can receive and manage them as a material or a waste. If a DRMO determines that they can be managed as a material, the burden of proof is on the DRMO to show that the batteries are not being speculatively accumulated, to be exempt from regulation. If a DRMO is unsure of the recycling method to use, they should be conservative and receive and manage them as HW.

b. *Special Turn-In Requirements.*

(1) DRMOs will not accept mercury batteries which exhibit the following characteristics unless they are properly packaged and rendered safe to handle by the generating activity:

- Bulging of the positive terminal.

- Air tight in their plastic sleeves.

c. *Special Storage and Handling Requirements.*

(1) Mercury batteries must be stored in covered, well-drained, and ventilated storage areas and kept away from open flame and heat due to the possible presence of mercury vapor and hydrogen gas.

(2) Mercury batteries must not be stored in sealed air tight containers since they may give off hydrogen gas. The build up of hydrogen gas from these batteries may produce container over-pressure and lead to explosive conditions.

(3) If leaking containers holding mercury batteries are discovered, consult the host's spill contingency plan. Containers may be contaminated with mercury, mercuric oxide (both toxic), and/or potassium hydroxide.

d. *Special Processing Requirements.*

(1) Do not downgrade mercury batteries to scrap.

(2) Comply with the prohibitions/ requirements of the Mercury-Containing and Rechargeable Battery Management Act pertaining to the sale of mercuric-oxide batteries. (see paragraph D, above).

6. Silver (Ag) Batteries.

a. Silver batteries are required to be managed in the precious metals recovery program regardless of whether they are handled as a universal waste or not. However, if the battery is not eligible for universal waste in your state, then it should be regulated as a HW due to the presence of silver (D011). If the battery has electrolyte in it, (potassium hydroxide, chemical symbol KOH), it may also be regulated as an EPA corrosive (D002).

NOTE: Overseas – Consult OEBGD, FGS and host nation requirements.

b. Precious metals bearing batteries that are HW and are recycled can be managed under the regulations for recyclable materials, (40 CFR

266.70). Silver batteries being reclaimed must be manifested. DRMOs must maintain the following records to show that the DRMO is not speculatively accumulating silver batteries:

(1) Records showing the volume of silver batteries at the beginning of the calendar year.

(2) The amount of batteries received during the calendar year.

(3) The amount of materials remaining at the end of a calendar year

c. Refer to DRMS-I 4160.14 Volume VIII, Chapter 4 for turn-in requirements.

d. Special Storage and Handling Requirements.

(1) *Silver-bearing batteries.* The silver oxide in the battery is a strong oxidizer, constituting a fire and explosion risk, particularly if it comes in contact with ammonia or organic materials. Therefore, it must be stored away from these materials. Also, serious chemical burns can result from the electrolyte if it comes in contact with skin or eyes.

(2) DRMOs will accept accountability but not physical custody of Navy propulsion batteries containing silver. These batteries contain explosive devices, squibs, charges, etc. They are dangerous to process and store. Generators will retain physical custody until shipping instructions and fund citations are received from DRMS-LH/DRMSI-O.

(3) Silver batteries that are new, unused, and/or shelf-life expired usually contain no KOH. The KOH is generally stocked in a container independent of the batteries. The KOH should be processed independently from the batteries.

7. Thermal Batteries.

a. Regulatory Information.

(1) Thermal batteries being discarded through disposal are normally regulated as a HW due to the presence of chromium. The RCRA

waste code is D007. DRMOs should be aware for the potential presence of asbestos associated with these batteries.

(2) Recycling. Some inert thermal batteries or residues may be recycled for precious metals recovery under 40 CFR 266.70.

b. Special Turn-In Requirements.

(1) DRMOs will not accept these batteries until they have been rendered inert by the generating activity or service designated collection points.

(2) Generators must identify whether any thermal battery contains asbestos upon turn-in.

(3) DRMOs will accept residue scrap from inert batteries (see DoD 4160.21-M, Chapter 10). Thermal batteries will be processed as scrap for precious metal recovery or sale. Refer to DRMS-I 4160.14 Volume VIII, Chapter 4 for precious metals program guidance.

8. Carbon-Zinc (LeClanche) Batteries.

Carbon-Zinc batteries are not regulated as a HW under RCRA when discarded. However, they are regulated as a HW in some states that utilize bioassay characterization criteria (e.g. Alaska, California, Minnesota, Rhode Island, and Washington). DRMOs need to check their state regulations to determine if these batteries are regulated if discarded.

NOTE: Overseas – Consult OEBGD, FGS, and host nation regulations.

9. Alkaline Batteries.

Alkaline batteries are not regulated as a HW under RCRA when discarded. However, they are regulated as a HW in some states that utilize bioassay characterization criteria (e.g. Alaska, California, Minnesota, Rhode Island, and Washington). DRMOs need to check their state regulations to determine if these batteries are regulated if discarded.

NOTE: Overseas – Consult OEBGD, FGS, and host nation regulations

I. PROPERTIES OF BATTERIES.

See Enclosure 4.